

Patent claims:

1. A sensor element for detecting particles possibly contained in an analyte,
 - having a substrate;
 - having at least two electrodes in and/or on the substrate;
 - having catcher molecules which are immobilized on a surface region of the substrate and are set up in such a way that they hybridize with particles to be detected that are possibly contained in an analyte, which particles have a label having different electrical properties than the analyte;
 - having a detection device coupled to the electrodes and serving for detecting an alteration of the capacitive component of the impedance between the electrodes on account of labels situated in a region surrounding the electrodes owing to a hybridization event.
2. The sensor element as claimed in claim 1, having an electrically insulating layer between the electrodes and the catcher molecules and/or on regions of the substrate between the electrodes.
3. The sensor element as claimed in claim 1 or 2, in which the catcher molecules are immobilized on or above the electrodes, on the one hand, and between the electrodes, on the other hand.
4. The sensor element as claimed in one of claims 1 to 3, set up as a biosensor element.
5. The sensor element as claimed in one of claims 1 to 4, set up as a monolithically integrated sensor element.

6. The sensor element as claimed in one of claims 1 to 5, which has two electrodes, and in which the detection device is set up for detecting an AC current signal on account of an AC voltage signal applied between two electrodes.

7. The sensor element as claimed in one of claims 1 to 6, which has two pairs of electrodes, and in which the detection device is set up for detecting a current signal at one of the pairs and for detecting a voltage signal at the other of the pairs.

8. The sensor element as claimed in one of claims 1 to 7, in which the catcher molecules are arranged at such a distance from one another and/or in which the labels have such a dimensioning that, in the case of hybridization events, the region between the electrodes is free of a continuous bridging by the labels.

9. The sensor element as claimed in one of claims 1 to 8, in which the labels are formed from an electrically insulating material.

10. The sensor element as claimed in one of claims 1 to 9, in which the labels have a relative permittivity which is greater than a relative permittivity of the analyte.

11. The sensor element as claimed in one of claims 1 to 9, in which the labels have a relative permittivity which is less than a relative permittivity of the analyte.

12. The sensor element as claimed in one of claims 1 to 8, in which the labels are formed from an electrically conductive material.

13. The sensor element as claimed in claim 12,
in which the labels are formed from small metallic balls having
dimensions in the nanometers range.

14. A sensor array
having a plurality of sensor elements as claimed in one of
claims 1 to 13 which are formed in and/or on the substrate.

15. A method for detecting particles possibly contained in an
analyte,

- with a sensor element
 - o having a substrate;
 - o having at least two electrodes in and/or on the substrate;
 - o having catcher molecules which are immobilized on a surface region of the substrate and are set up in such a way that they hybridize with particles to be detected that are possibly contained in an analyte, which particles have a label having different electrical properties than the analyte;
 - o having a detection device coupled to the electrodes and serving for detecting an alteration of the capacitive component of the impedance between the electrodes on account of labels situated in a region surrounding the electrodes owing to a hybridization event;
- in which case, in accordance with the method,
 - o the analyte is brought into operative contact with the catcher molecules immobilized on the surface region of the substrate in such a way that the catcher molecules hybridize with particles to be detected that are possibly contained in the analyte, which particles have a label having different electrical properties than the

analyte;

- o the detection device coupled to the electrodes is used to detect an alteration of the capacitive component of the impedance between the electrodes on account of labels situated in a region surrounding the electrodes owing to a hybridization event.